

# Frontier Geosciences Inc.

*Environmental Research & Specialty Analytical Laboratory*  
414 Pontius Ave N • Seattle WA 98109

August 19, 2002

Paul Schlenger  
Anchor Environmental  
1411 4<sup>th</sup> Avenue, Suite 1210  
Seattle, WA 98101

Re: Total Hg in Tissues: G-P Log Pond

Dear Mr. Schlenger,

Enclosed are results for total mercury in crab tissue samples collected on July 31, 2001. The samples were received in good condition on August 1, 2001. Following receipt, the samples were rinsed with reagent water to remove particulate matter from the exterior of the shells and immediately placed in frozen storage until sample preparation could take place.

Prior to digestion for total mercury, each sample was homogenized in an acid-cleaned blender. Approximately one half gram of each sample was digested with 10 ml of hot refluxing 70% $\text{HNO}_3$ /30% $\text{H}_2\text{SO}_4$  for approximately two hours. The digests were then diluted to a final volume of 40 ml with a solution of 10% (v/v) 0.2N BrCl. Aliquots of each sample were analyzed by  $\text{SnCl}_2$  reduction, dual gold amalgamation, and cold vapor atomic fluorescence (CVAFS) detection. No analytical difficulties were encountered. Please feel free to call me if you have any questions.

Best Wishes,



Lucas Hawkins  
Project Manager

**Total Mercury in Tissues-GP Log Pond**  
(Anchor Environmental c/o Kim Magruder)

*analyzed by:*

Frontier Geosciences, Inc.  
414 Pontius Avenue North, Suite B, Seattle, WA 98109  
phone: (206) 622-6960 fax: (206) 622-6870

Samples analyzed: August 14, 2002 (THG12-020814-1)

<b>Sample Identification</b>	<b>Date Collected</b>	<b>Total Hg, ng/g*</b>
SS-74A	7/22/2002	28.9
SS-74B	7/22/2002	21.6
SS-74C	7/22/2002	18.7
SS-75A	7/22/2002	23.4
SS-75B	7/22/2002	28.5
SS-75C	7/22/2002	21.5
SS-76A	7/22/2002	14.3
SS-76B	7/22/2002	15.2
SS-76C	7/22/2002	9.54

\*Blank corrected

**Total Mercury in Tissues-GP Log Pond**  
(Anchor Environmental c/o Kim Magruder)

*analyzed by:*

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414 Pontius Avenue North, Suite B, Seattle, WA 98109  
phone: (206) 622-6960 fax: (206) 622-6870

Samples analyzed: August 14, 2002 (THG12-020814-1)

<b>Sample Identification</b>	<b>Date Collected</b>	<b>Total Hg, ng/g</b>
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**Method blanks**

Blank-1		0.26
Blank-2		0.15
Blank-3		0.15
Blank-4		0.19
<b>Mean</b>		<b>0.19</b>
<b>Estimated MDL</b>		<b>0.16</b>
<b>Method MDL</b>		<b>0.50</b>

**Certified Reference Materials**

DORM-2		3,662
recovery		78.9%
reference value		4,640

**Total Mercury in Tissues-GP Log Pond**  
(Anchor Environmental c/o Kim Magruder)

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phone: (206) 622-6960 fax: (206) 622-6870

Samples analyzed: August 14, 2002 (THG12-020814-1)

<b>Sample Identification</b>	<b>Date Collected</b>	<b>Total Hg, ng/g*</b>
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**Analytical Replicates**

SS-74A	7/22/2002	28.91
SS-74A MD	7/22/2002	27.60
<b>Mean</b>		<b>28.26</b>
<b>RPD</b>		<b>4.6%</b>

\*Blank corrected

**Total Mercury in Tissues-GP Log Pond**  
(Anchor Environmental c/o Kim Magruder)

*analyzed by:*

Frontier Geosciences, Inc.  
414 Pontius Avenue North, Suite B, Seattle, WA 98109  
phone: (206) 622-6960 fax: (206) 622-6870

Samples analyzed: August 14, 2002 (THG12-020814-1)

Sample Identification	Date Collected	Total Hg, ng/g*
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**Matrix spikes**

SS-74A MS	7/22/2002	137.5
spiking level		115.8
net		109.2
recovery		94.3%
SS-74A MSD	7/22/2002	154.6
spiking level		125.1
net		126.4
recovery		101.0%

\*Blank corrected

## Chain of Custody Record &amp; Laboratory Analysis Request

Page 1 of 1

Turnaround Requested: \_\_\_\_\_

Anchor Contact: Paul Schlegler**ANCHOR**

ENVIRONMENTAL, L.L.C.

1411 4th Avenue, Suite 1210

Seattle, WA 98101

Ph: (206) 287-9130 Fax: (206) 287-9131

Lab Contact: <u>Lisa Hunking</u>		Proj. Name: <u>GP Log Pond</u>			Analyses Requested										Notes/ Comments:	
Lab: <u>Frontier</u>		Proj. Number: <u>02-0030-01</u>			<u>Total Hg-low level FGS Oil</u> <u>method with initial rinsed crabs</u>										<u>Whole body</u>	
Address: <u>414 Pontius Ave N, Sk B.</u>		Sampler: <u>Paul Schlegler</u>														
<u>Seattle 98109</u>																
Phone: <u>206-622-6960</u>		Shipping Method: <u>hand deliver</u>														
Fax: <u>206 622-6870</u>		AirBill:														
Sample ID	Sample Date	Sample Time	Sample Matrix	# Containers												
<u>SS-74A</u>	<u>7/22/02</u>	<u>1715</u>	<u>Tissue</u>	<u>1</u>												
<u>SS-74B</u>		<u>1715</u>		<u>1</u>												
<u>SS-74C</u>		<u>1715</u>		<u>1</u>												
<u>SS-75A</u>		<u>1335</u>		<u>1</u>												
<u>SS-75B</u>		<u>1335</u>		<u>1</u>												
<u>SS-75C</u>		<u>1335</u>		<u>1</u>												
<u>SS-76A</u>		<u>1345</u>		<u>1</u>												
<u>SS-76B</u>		<u>1730</u>		<u>1</u>												
<u>SS-76C</u>	<u>↓</u>	<u>1730</u>	<u>↓</u>	<u>1</u>												

Relinquished: (Signature) <u>Margaret McCarty</u>	Relinquished: (Signature) <u>A. Malachuk</u>	Relinquished: (Signature) <u>A. Malachuk</u>	Special Instructions/Notes	
Printed Name: <u>Margaret McCarty</u>	Printed Name:	Printed Name:		
Company: <u>Anchor</u>	Company:	Company:		
Date/Time: <u>7/23/02 9:15 am</u>	Date/Time:	Date/Time:		
Received By: <u>A. Vandervort</u>	Received By: <u>A. Malachuk</u>	Received By:		
Printed Name: <u>A. Vandervort</u>	Printed Name: <u>A. Malachuk</u>	Printed Name:		
Company: <u>FGS</u>	Company: <u>Frontier</u>	Company:		
Date/Time: <u>7/23/02 9:15</u>	Date/Time: <u>7-23-02 0950</u>	Date/Time:		
			# of Coolers: <u>1</u>	Cooler Temp(s): <u>0.0</u>
			COC Seals Intact? <u>N/A</u>	Bottles Intact? <u>N/A</u>

# Frontier Geosciences Inc.

*Environmental Research & Specialty Analytical Laboratory*  
414 Pontius Ave N - Seattle WA 98109

September 18, 2002

Paul Schlenger  
Anchor Environmental  
1411 4<sup>th</sup> Avenue, Suite 1210  
Seattle, WA 98101

Re: Total Hg in Tissues: G-P Log Pond Crabs

Dear Mr. Schlenger,

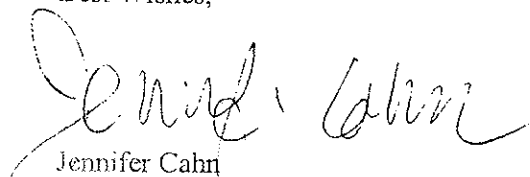
Enclosed are results for total mercury in 3 crab tissue samples collected on August 21, 2001. The samples were received in good condition on August 22, 2001. Following receipt, the samples were rinsed with reagent water to remove particulate matter from the exterior of the shells and immediately placed in frozen storage until sample preparation could take place.

Prior to digestion for total mercury, each sample was homogenized in an acid-cleaned blender. Approximately one half gram of each sample was digested with 10 ml of hot refluxing 70% HNO<sub>3</sub>/30% H<sub>2</sub>SO<sub>4</sub> for approximately two hours. The digests were then diluted to a final volume of 40 ml with a solution of 10% (v/v) 0.2N BrCl. Aliquots of each sample were analyzed by SnCl<sub>2</sub> reduction, dual gold amalgamation, and cold vapor atomic fluorescence (CVAFS) detection. No analytical difficulties were encountered, with one item to note.

- The matrix duplicate RPD for sample Ref-1 was elevated at 53.8%. The difference between the native sample and sample duplicate is greater than can be explained by analytical variability. A reanalysis of the matrix duplicate was performed yielding similar results. It is possible that the sample was insufficiently homogenized. Please note that the matrix spike and matrix spike duplicate were within control limits. Rehomogenization and reanalysis of the sample may be performed at the client's discretion.

Please feel free to call me if you have any questions.

Best Wishes,

  
Jennifer Cahn  
Project Coordinator

206 422 1060  
206 422 1070  
414 Pontius Ave N  
Seattle, WA 98109

**Total Mercury in Tissues-GP Log Pond**  
(Anchor Environmental c/o Paul Schlenger)

*analyzed by:*

Frontier Geosciences, Inc.  
414 Pontius Avenue North, Seattle, WA 98109  
phone: (206) 622-6960 fax: (206) 622-6870

Samples analyzed: September 6, 2002 (THG8-020906-1)

<b>Sample Identification</b>	<b>Date Collected</b>	<b>Total Hg, ng/g*</b>
Ref 1	8/21/2002	36.5
Ref 2	8/21/2002	19.9
Ref 3	8/21/2002	308

\*Blank corrected

**Total Mercury in Tissues-GP Log Pond**  
(Anchor Environmental c/o Paul Schlenger)

*analyzed by:*

Frontier Geosciences, Inc.  
414 Pontius Avenue North, Seattle, WA 98109  
phone: (206) 622-6960 fax: (206) 622-6870

Samples analyzed: September 6, 2002 (THG8-020906-1)

<b>Sample Identification</b>	<b>Date Collected</b>	<b>Total Hg, ng/g</b>
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**Method blanks**

Blank-1		0.07
Blank-2		0.06
Blank-3		0.12
Blank-4		0.11
<b>Mean</b>		<b>0.09</b>
<b>Estimated MDL</b>		<b>0.09</b>
<b>Reporting Limit</b>		<b>0.45</b>

**Certified Reference Materials**

TORT-2		214.6
recovery		79.5%
reference value		270.0

**Total Mercury in Tissues-GP Log Pond**  
(Anchor Environmental c/o Paul Schlenger)

*analyzed by:*

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phone: (206) 622-6960 fax: (206) 622-6870

Samples analyzed: September 6, 2002 (THG8-020906-1)

<b>Sample Identification</b>	<b>Date Collected</b>	<b>Total Hg, ng/g*</b>
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**Analytical Replicates**

Ref 1	8/21/2002	36.48
Ref 1 MD	8/21/2002	21.01
<b>Mean</b>		<b>28.75</b>
<b>RPD</b>		<b>53.8%**</b>

\*Blank corrected

\*\*RPD above acceptable limit of 25%. Please see case narrative.

**Total Mercury in Tissues-GP Log Pond**  
(Anchor Environmental c/o Paul Schlenger)

*analyzed by:*

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Samples analyzed: September 6, 2002 (THG8-020906-1)

<b>Sample Identification</b>	<b>Date Collected</b>	<b>Total Hg, ng/g*</b>
----------------------------------	---------------------------	----------------------------

**Matrix spikes**

Ref 1 MS	8/21/2002	176.7
spiking level		161.4
net		140.2
recovery		86.9%
Ref 1 MSD	8/21/2002	178.6
spiking level		157.0
net		142.1
recovery		90.5%

\*Blank corrected

## Environmental Research &amp; Specialty Analytical Laboratory

Date: August 22, 2002 Page: 1 of 1

## Chain-of-Custody Record & Laboratory Analysis Request

[illegible]